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ZOOLOGICAL ABSTRACTS

Baker, H. B. The Mollusca collected by the University of Michigan—Walker Expedition in Southern Vera Cruz, Mexico. I. *Occasional Papers, Mus. of Zool., Univ. of Mich.,* No. 106. 1–94, 17 plates, Feb. 1922.

A very interesting paper in which the ecological features of the region are outlined and classified according to the method of Ruthven in papers from this region. Lowland forest, lowland forest clearings, savannah forests and thickets, and savannah grassland constitute the land habitats. Lowland forest ponds, savannah ponds, sluggish and rapid rivers, and lake (laguna) make up the water habitats. The species are arranged systematically, some ecological information being given under each. Both the systematic and ecological work is well done and the paper is a very valuable addition to the literature of Mexican Mollusca. F. C. BAKER.

Campbell, V. A., D. Hargood-Ash, and Leonard Hill. The effect of the cooling power of the atmosphere on body metabolism. *J. Physiol., London,* 55: 259–264. 1921.

Experiments on man are recorded, indicating that the basal metabolism of the body cells is raised by cool out-of-door conditions, and that shivering is not necessary to raise metabolism. L. R. DICE.

Eigenmann, Carl H., and William Ray Allen. A leaf mimicking fish. *Biol. Bull.* 41, 301–305, figs. 1–3, 1921. On the basis of observations in South America, of the native name for the fish, and of its structure and coloration as determined in the laboratory, the authors conclude that the fishes of the genus *Monocirrhus* are leaf-mimicking. CARL L. HUBBS.

Grier, N. M. Final Report on the Study and Appraisal of Mussel Resources in selected Areas of the Upper Mississippi River. *American Midland Naturalist,* 1–33, Jan. 1922.

This paper describes the local conditions of bottom and shore for a stretch of the Mississippi River about 85 miles in length, above and below Lake Pepin. The effect of dams and other modifications are noted, as well as the relative abundance of the different species of mussels. While undertaken from the standpoint of commerce, the paper contains much of interest to the ecologist. F. C. BAKER.

Hartridge, H. The avoidance of objects by bats in their flight. *J. Physiol.,* 54: 54–57. 1920.

Suggests that a bat during flight emits a note of short wave-length and that this sound is reflected from objects in the vicinity, forming sharp sound reflections, which the bat is able to discriminate with its acute hearing. The animal is thus able to detect and avoid objects while it is flying in complete darkness. L. R. DICE.

Howe, R. Heber, Jr. The distribution of New England Odonata. *Proc. Boston Soc. Nat. Hist.,* 36: 105–133. 1921.

A general discussion of the factors affecting the distribution of New England Odonata: Physiography, air temperature and moisture, wind, water temperature, salinity, ecologic station, etc. Howe thinks that to attempt to define too closely and arbitrarily life zone boundaries is to confuse rather than to elucidate the problems of distribution. He considers it best to recognize only Austral and Boreal elements in the New England fauna, and thinks that the recognition of the Transition zone is

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illogical. However, he states that the Alleghenian and Carolinian faunal areas are easily recognized, and he also recognizes a Maritime District in New England. L. R. DICE.

Hubbs, Carl L. Geographical variation of *Notemigonus crysoleucas*—an American minnow. *Trans. Illinois St. Acad. Sci.,* 11: 147–151. 1921.

An increase in the number of anal rays from northwest to southeast is demonstrated. The variations are not correlated as usual with stream systems, perhaps rather with temperature. A dwarfing due apparently to unfavorable conditions is noted and is considered an instance of the great adaptibility of the species. T. L. HANKINSON.

Järvi, T. H. Die kleine Maräne *Coregonus albula* L. im Deitelesee. Eine ökologische und ökonomische Studie. *Ann. Acad. Sci. Fennicae,* ser. A, 14: 1–301, many figures and maps, 1920. A very extensive study of the ecology, life-history and economics of a European fish related to our lake-herring (*Leucichthys*). The fish discussed is a typical plankton feeder; it usually lives in the deeper parts of the lake, but in early summer lives in shallow water; it makes diurnal vertical movements. Spawning occurs in the fall, the time being controlled by the water temperature (7° to 6° C.). Its enemies and parasites are mentioned. Its growth, which is slow, is discussed at length; the age determinations were made by the scale method. The same paper was published in Swedish in 1919, under the title: Siklojan i Finska Sgöar. I. Keitele (Finlands Fiskerier, Bd. 5). CARL L. HUBBS.

Moore, J. Percy. Use of fishes for control of mosquitoes in northern fresh waters of the United States. App. 4, *Rept. U. S. Comm. Fish. for 1922.* (Bur. Fish. Doc, No. 923) : 1–60. 1922. A general consideration of the biological control of mosquitoes, with particular reference to fish enemies. Field experiments coupled with food studies indicate the relative value of different fishes in different situations. CARL L. HUBBS.

Needham, James G., Chancey Juday, Emmeline Moore, Charles K. Sibley, and **John W. Titcomb.** A biological survey of Lake George, N. Y. *State of New York, Conservation Commission,* 1922; 78 pp.; 27 figs. A comprehensive study of Lake George, undertaken in 1920 for the purpose of determining the most practical methods of increasing fish production. The recommendations are made both by Needham and Titcomb, and seem wise to the reviewer. Needham discusses the hydrography and the benthic and planktonic vegetation, and gives a general and somewhat popular account of the turn-overs of the lake's vegetation into fish food, finally recommending further studies in the fishery biology of inland lakes. He stresses the need of an experimental hatchery. Juday gives the results of his investigations into the distribution of temperatures, light, dissolved oxygen and carbon dioxide and plankton throughout the lake, and of the organisms on the bottom. Moore traces back to primary sources the food supply of a number of the important fishes of the lake. Sibley has an annotated list of the fishes of the lake, and a rather brief account of the food of the adult game fishes, Moore having studied the young fishes chiefly. Titcomb concludes the paper with an article on fish cultural observations.

Lake George is over thirty miles long and rather narrow. A small part of the bottom, in three isolated areas, is over 100 feet deep; the maximum depth recorded is 175 feet. The water is unusually clear; attached green plants grow to depths of at least 50 feet, and plankton algae are abundant at three times this depth. The nannoplankton was found to be over forty times greater (by weight) than the net plankton; *Aphanocapsa delicatissima* was its chief element. The chief vegetation areas are the "weed beds," chiefly Potamogetons; the "grass beds" of Nitella, at depths of 22 to 45 feet, and finally the "moss beds" in still deeper water. The plant beds are very productive of fish food, the free and attached plants and plant fragments supporting an abundant growth of invertebrates, chiefly eaten by the fishes. In the open water, the food chain comprises phytoplankton, entomostracans, white-fish (*Leuc-*

ichthys), lake trout. The final element of this chain is considered the most important fish of the lake. CARL L. HUBBS.

Osborne, W. A. Physiological factors in the development of an Australian race. *Med. J. Australia,* 1920 v. 2: 261–267. 1920.

A discussion of the factors concerned in the establishment of a permanent white race in Australia. Race, food, disease, and climate are considered. The rearing of healthy children is of course the greatest difficulty. L. R. DICE.

Pellegrin, Jacques. Les poissons des eaux douces de l'Afrique du Nord francaise Maroc Algerie, Tunisie, Sahara. *Mem. Soc. Sci. nat. Maroc,* 1, No. 2, 1–216, 1921. This paper contains a general discussion of the geographical distribution of fresh-water fishes, with particular reference to Africa. The regions and subregions recognized are named and mapped. The northeastern portion of Africa, north of the Sahara, is discussed in detail, and designated the Mauritanic subregion of the Palearctic region. The African, Ethiopian or Equatorial Cyprinoid region is divded into seven subregions. Of further interest to ecologists are the author's discussions of the fishes of brackish, thermal, mineral, subterranean and desert waters. The 54 forms of fishes known from the area under discussion are all described and figured. CARL L. HUBBS.

Richardson, R. E. Changes in the bottom and shore fauna of the middle Illinois River and its connecting lakes since 1913–1915 as a result of the increase, southward, of sewage pollution. *Bul. Ill. Nat. Hist. Survey,* 14: 33–75. 1921.

Marked changes in the bottom fauna were noted in this portion of the river as a result of the sewage contamination. Many intolerant forms were totally obliterated, while pollution and tolerant forms had invaded these areas. C. JUDAY.

Suter, Russell, and Emmeline Moore. Stream pollution studies. *State of New York, Conservation Commission.* Pp. 1–27, pls. 1–7. 1922. Organisms are considered, and recommended for practical use, as indicators of the intensity of stream pollution. The zone of recent pollution is characterized by sewage fungi, and near its lower limits by Tubifex; this leads into the septic zone, characterized by absence of algae and by the presence of certain insect larvae, notably *Eristalis.* The zone of recovery is marked by the abundance of bloodworms and the reestablishment of green plants. The energy and food relations of animals and plants in general, and specifically in relation to the zones of pollution, are briefly but well summarized. Figures of pollution, tolerant and clean-water organisms are given. Published data on the limits of tolerance of fishes to trade wastes are tabulated. CARL L. HUBBS.

Tiffany, Lewis Hanford. Algal food of the young gizzard shad. *Ohio Jour. Sci.,* 21, 113–122, 1921. This fish (*Dorosoma cepedianum*) is a plankton feeder. The gill rakers form an efficient sieve. Algae of many species predominate in the stomach contents, animals amounting to 0 to 30 percent only. Mud is taken only incidentally. The fish is important in that it holds a position as a direct connection between microscopic algae—the ultimate fish food—and the game fishes. CARL L. HUBBS.

Weymouth, Frank W. The Edible Clams, Mussels and Scallops of California. *Bull. 4, Fish and Game Comm., California,* pp. 1–72, 19 plates, 1920.

This paper is an attempt to estimate the economic importance of the shell fish industry and resources of California. It is based on a systematic plan, the species being arranged in more or less exact taxonomic relation to each other. There is an excellent key to the species which will be of use to those not versed in the mysteries of modern classifications.

The response of species to the physical environment is rather graphically brought out in a study of the clams of Anaheim Slough, where the different kinds of shellfish are described as burrowers, borers, fixed, and active animals. The dependence of animals on favorable habitats for development is brought out. About 50 pages are devoted to a description of the edible bivalves of California, and we believe this is one of the best attempts in this direction. Habitats and habits are given for each species, and some very interesting ecological notes are appended.

While the methods employed in this paper are somewhat different from those used in more technical ecological papers, there is, nevertheless, a vast amount of ecological information which the ecologist may use with profit. The illustrations are on the whole very good, several being the best seen of marine bivalves. FRANK C. BAKER.

Winslow, Mina L. Mollusca of North Dakota. *Mus. Zool., Univ. Mich., Occ. Papers,* No. 98. 18 pp. 1921.

A valuable paper on the Mollusca of this little-known region. Ecological notes are given concerning the character of the different lakes, several of which are so strongly alkaline as to be wholly or partially devoid of molluscan life. Forty-eight species of fresh water mollusks are enumerated, many of which are accompanied by ecological notes. There is a good bibliography of the literature relating to North Dakota Mollusca. F. C. BAKER.